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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/595,465	04/21/2006	Michael J. Petrillo	PHUS030428US	1106

38107 7590 04/21/2008

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
ELEY, JESSICA L	

ART UNIT	PAPER NUMBER
2884	

MAIL DATE	DELIVERY MODE
04/21/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/595,465	PETRILLO ET AL.	
	Examiner	Art Unit	
	JESSICA L. ELEY	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Art Unit: 2884

DETAILED ACTION

Drawings

The drawings are objected to because the couch is referred to as **24** in FIG. 1 and Fig. 3, but **20** in FIG. 2A and FIG. 2B. It is the examiner's understanding that couch **20** and couch **24** are the same; if this is not the case applicant may indicate so in the response to this action. If however the couch **20** in FIG. 2A and FIG. 2B is the same as the one shown in FIG. 1 and FIG. 3 it is requested that the same reference number be used.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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Claim Objections

Claim 21 objected to because of the following informalities: dependent on itself, should probably be claim 12. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 12, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sones et al. US 4,789,930 (henceforth referred to as Sones).

Regarding **claims 1 and 12**, Sones teaches a system and method for energy dependent gain correction for radiation detection, comprising:

A means for and method of emitting radiation concurrently of at least first and second preselected energy levels (column 8 lines 21-27);

A means for and method of generating associated sets of radiation data spanning both the first and second energy levels (column 9 lines 3-8), from the emitted radiation that is received by the detector assembly **14**, which itself is comprised of photodiodes covered by a layer of scintillation material;

A means for and method of determining associated energy values (column 11 lines 59-65) of the generated data sets; and

A means for and method of calibrating gain based on the determined centers and peaks of the acquired data sets (column 11 lines 59-65).

It is noted that Sones does not describe the photodiodes directly as solid state detectors. However, it is known in the art of radiation detection that a solid state detector can be realized by a photodiode.

Sones does not directly describe the system determining the associated centers of energy peaks, however this is inherent in the process taught by Sones. Since the process disclosed by Sones is obtaining the low and high energy mean pixel values (column 11 lines 29-31) these values would more often than not correspond to the center of energy peaks since the distribution of energy values will be greatest around the peak energy resulting in an average value indicative of the center of the energy peak.

Regarding **claim 21**, the method taught by Sones as discussed with reference to claim 12, further teaches:

Detecting the emitted radiation with a photodiode detector that converts radiation into electrical charge (column 8 lines 11-16); and

Generating the sets of radiation data from the electrical charge (column 10 lines 8-16).

It is noted that Sones does not describe the photodiodes directly as solid state detectors. However, it is known in the art of radiation detection that a solid state detector can be realized by a photodiode.

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Claims 2-10, 13-18, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sones et al. US 4,789,930 (henceforth referred to as Sones) as applied to claim 1 above, and further in view of Enos US 4,280,047.

Regarding **claims 2, 3, 13-14, and 22**, Sones teaches the use of a calibration phantom composed of various combinations of plexiglass or Lucite and aluminum (column 11 lines 13-28). Sones teaches one embodiment of the phantom but also teaches that various combinations can be used, moreover teaching that the more complex the combinations the more accurate the calibration. Sones does not directly teach the more complex combination of Lucite material being formed into a tank being filled with a radioisotope that emits at one energy level and interacts with a second means to produce a second energy level. However such a combination is known as illustrated by Enos.

Enos teaches a phantom comprising Lucite to create the walls of a tank (column 2 lines 55-56) filled with liquid **11** which may contain radioisotope Technetium (column 3 lines 3-5) and further including lead disks **13**. The phantom taught by Enos when irradiated contains a contrast [first and second energy levels] between the areas where the lead filled disks are present and the areas where it is only the liquid (column 4 lines 12-15). It is obvious to a person of ordinary skill in the art at the time the invention was made to use the phantom taught by Enos with the calibrating system and method taught by Sones, since Sones teaches that more complex combinations of Lucite and another basis material will create a more accurate calibration, and the phantom taught by Enos qualifies as said more complex structure leading one of ordinary skill in the art the motivation to substitute the phantom taught by Enos in the system taught by Sones so that more accurate calibration results may be obtained.

Regarding **claims 4 and 5**, the phantom taught by Enos contains steps **12** composed from metal sheets each presenting a planar surface **18** shown in FIG. 4 to be present along the rear side of the tank opposite the detectors, each step containing lead disks **13** which emit the second energy level radiation.

Regarding **claim 6**, since the phantom taught by Enos contains lead sheets surrounded by Technetium the characteristic x-ray emitted by lead is 77.5 KeV, and Technetium will emit secondary radiation, outside the spectrum of the lead pulse, sporadically while interacting with the lead spectra, as is known and evidenced by Enos US 5,512,754 column 8 lines 31-37.

Regarding **claims 7 and 8**, the phantom taught by Enos may be filled with other radioactive materials (Enos, column 3 lines 5-6). One such material is Cobalt-60, which it is known, has two main photopeak energies.

Regarding **claims 9 and 10**, the phantom taught by Enos contains the radioisotope Technetium. Furthermore Enos teaches that the phantom may be filled with other radioactive materials (Enos, column 3 lines 5-6). As such it would be obvious to a person of ordinary skill in the art at the time the invention was made to try the use of additional radioisotopes as well as combinations as these combinations on isotopes would have various effects on the "contrast" (column 3 line 3) between the areas where lead disks are present and the areas where they are not, thus changing the capabilities of the phantom to calibrate resolution (column 4 lines 49-52).

Regarding **claim 15**, the phantom taught by Enos contains the radioisotope Technetium. Furthermore Enos teaches that the phantom may be filled with other radioactive materials (Enos, column 3 lines 5-6). As such it would be obvious to a person of ordinary skill in the art at the time the invention was made to try the use of additional radioisotopes as well as combinations as these combinations on isotopes would have various effects on the "contrast" (column 3 line 3) between the areas where lead disks are

present and the areas where they are not, thus changing the capabilities of the phantom to calibrate resolution (column 4 lines 49-52).

Regarding 16-17 and 20, Enos teaches a phantom filled with liquid **11** [radioisotope layer]**, which** may contain radioisotope Technetium (column 3 lines 3-5), and further including lead disks **13** [metal layer]. The phantom taught by Enos when irradiated contains a contrast [first and second energy levels] between the areas where the lead filled disks are present and the areas where it is only the liquid (column 4 lines 12-15).

Regarding **claim 18**, the phantom taught by Enos may be filled with other radioactive materials (Enos, column 3 lines 5-6). One such material is Cobalt-60, which it is known, has two main photopeak energies.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sones et al. US 4,789,930 (henceforth referred to as Sones) as applied to claim 1 above and further in view of Karellas US 2002/0070365 A1.

Regarding **claim 11**, the radiation detection system taught by Sones does not specifically disclose the detectors including an array of detector elements that convert gamma radiation directly into electrical charge. Karellas teaches a detector CCD **98** that produces a number of electrons in direct proportion to the number of optical photons and to the energy of the detected x-rays or gamma-rays (¶0135), thus teaching a detector element that converts gamma radiation directly into electrical charge. Karellas also teaches the corresponding generating means 144 which additionally anticipates the removal of dead pixels (¶0147). It would be obvious to a person of ordinary skill in the art at the time the invention was made to update the detector used by Sones with a CCD detector such as that taught by Karellas, since this detector provides the

added benefit of combining x-ray radiographic images with high detail radionuclide images with the same detector (¶0129).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sones et al. US 4,789,930 (henceforth referred to as Sones) and Enos US 4,280,047, as applied to claim 13 above in further view of Mackie et al. (Mackie) US 2002/0080912 A1.

Regarding **claim 19**, Enos teaches a phantom filled with liquid **11**, which may contain radioisotope Technetium (column 3 lines 3-5) and further including lead disks **13**. The phantom taught by Enos when irradiated contains a contrast [first and second energy levels] between the areas where the lead filled disks are present and the areas where it is only the liquid (column 4 lines 12-15).

Mackie teaches a system and method for calibrating radiation therapy equipment [radiation imaging device], which comprises;

Electronic portal imaging device **18** [pixel energy peak analyzer], which produces a portal image **40**, and

Computer **20** [calibration processor], which processes the beam fluence profile **34** [energy peaks and energy values] of the portal image [generated data sets] and calibrating certain geometrical (¶0071) aspects [performance, and offset] of the radiation therapy system, based on the fluence profile **34**.

Furthermore, Mackie teaches that a variety of different phantoms such may be used in place of the phantom directly described (¶0046). One example of another nuclear imaging phantom is taught by Enos.

It is obvious to a person of ordinary skill in the art at the time the invention was made to use the phantom taught by Enos with the calibrating system and method taught by Mackie, since Mackie suggests

using any phantom known in the art (¶0046) and the phantom taught by Enos shows an system distortion as well as resolution changes effected by contrast, depth and scatter (Enos, column 4 lines 50-52).

Response to Arguments

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. ELEY whose telephone number is (571)272-9793. The examiner can normally be reached on Monday - Thursday 8:00-6:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Constantine Hannaher/
Primary Examiner, Art Unit 2884

/J. L. E./
Examiner, Art Unit 2884